Advancement Handbook for Quartermaster

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PREFACE

The purpose of the Advancement Handbook is to help you focus your preparation for Navywide advancement-in-rating examinations. The bibliographies (BIBs) together with this handbook form a comprehensive examination study package. Since this handbook provides skill and knowledge components for each paygrade of the Quartermaster rating, it helps you concentrate your study on those areas that may be tested. This feature will help you get the most out of your study time.

Each page in Parts 1 through 4 of this Advancement Handbook presents general skill areas, specific skill areas, the knowledge factors associated with each skill area, the pertinent references that address each skill, and the subject areas that may be covered on the examination. The skill statements describe the skills you are expected to perform for each paygrade. The skill statements are <u>cumulative</u>; that is, you are responsible for the skills for the paygrade you are competing for, your present paygrade, and all paygrades below.

Although this handbook is very comprehensive, it cannot cover all the tasks performed in the rating. As a result, the advancement examinations may contain questions more detailed than described in the *"Exam Expectations"* section of the skill areas.

Remember that advancement competition is keen, so your keys to advancement include not only comprehensive advancement examination study but also sustained superior performance.

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Part 1

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General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine ranges**
Knowledge you should have to perform this skill:	• State the components of a typical surface radar set and describe how radar works • Discuss the proper selection of radar targets and taking ranges in the proper order • State the procedure for obtaining a radar range
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying and describing the components of a radar set and obtaining ranges by navigational radar.

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General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine magnetic compass errors using gyrocompass**
Knowledge you should have to perform this skill:	• Define the terms associated with magnetic compass error • Perform compass error calculations • Determine magnetic deviation • Discuss the process of correcting a magnetic compass for deviation
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the types of errors that effect magnetic compasses; performing compass error calculations; and identifying the process of correcting a magnetic compass for deviation.

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General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine danger and caution soundings. Determine and highlight shoal waters**
Knowledge you should have to perform this skill:	• Determine minimum depth of water in which a vessel can safely operate • Identify proper chart preparation techniques
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on determining danger and caution soundings; highlighting shoal waters; and using proper chart preparation techniques.

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General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine ship's position and distance relative to planned intended movement (PIM). Compute four-hour PIM positions**
Knowledge you should have to perform this skill:	• Explain the basic principals of PIM and the procedure used to calculate time ahead or behind PIM • Calculate four-hour PIM positions based on speed of advance
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on determining time ahead or behind PIM; and calculating the distance of four-hour PIM positions.

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General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine meridian passage**
Knowledge you should have to perform this skill:	- State how meridian passage is useful to the navigator - Obtain data and perform calculations to determine the time of local meridian passage (LAN)
References you should study to gain the knowledge you need to perform this skill:	- Quartermaster, NAVEDTRA 12120 - Nautical Almanac
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on using data, publications, and forms to compute the time of local meridian passage (LAN).

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General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine ship's position using running fix method**
Knowledge you should have to perform this skill:	• Describe the procedure used to obtain a running fix • Identify the procedure used to advance a line of position
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for obtaining a running fix and advancing lines of position.

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General QM3 *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine gyrocompass errors by use of visual ranges**
Knowledge you should have to perform this skill:	• Identify the procedures used to determine gyrocompass error by visual range • Discuss the accuracy of marking a visual range as it passes down the port or starboard side
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on determining gyro error by using terrestrial range.

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General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine ship's speed of advance (SOA)**
Knowledge you should have to perform this skill:	• Identify ship's speed indicating equipment • Perform calculations to determine ship's SOA between fixes
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on performing calculations to determine a ship's SOA.

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General *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Compute and apply ship's set and drift**
Knowledge you should have to perform this skill:	• Define the terms *set* and *drift* • Identify the procedures used to determine ship's set and drift between fixes and to compensate for ship's set and drift
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on defining the terms *set* and *drift*; determining ship's set and drift; and compensating for set and drift.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Compute ship's course and speed made good**
Knowledge you should have to perform this skill:	• Identify the procedure used to determine ship's course and speed made good between fixes
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on determining a ship's course and speed made good.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Compute estimated time of arrival (ETA)**
Knowledge you should have to perform this skill:	• Perform time, speed, and distance problems • Obtain data and perform calculations to determine ship's ETA to a known position
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on determining a ship's ETA to a known position using the time, speed, and distance formula.

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General *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Compute gyrocompass errors by Sun's azimuth**
Knowledge you should have to perform this skill:	• Identify the procedure used to obtain an azimuth of the Sun • Identify the data, publications, and forms required to compute gyro error by azimuth • Obtain data and perform calculations to determine gyro error by azimuth
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Nautical Almanac • Pub 229
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on computing gyrocompass error by azimuth.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Distinguish between International and Inland rules of the road**
Knowledge you should have to perform this skill:	• Identify and explain the International Navigation Rules • Identify and explain the Inland Navigation Rules
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Navigation Rules, International – Inland, COMDTINST M16672.2D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying international and inland General Rules, Steering and Sailing Rules, Lights and Shapes, Sound and Light Signals; and recognizing exemptions to the rules.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Apply compass errors to obtain compass courses and true courses**
Knowledge you should have to perform this skill:	• Define the terms associated with magnetic compass error • Perform compass error calculations to convert true course to compass course and compass course to true course
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on defining the types of magnetic compass errors and applying compass errors to obtain compass courses and true courses.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Plot weather message information**
Knowledge you should have to perform this skill:	• Discuss the procedures used to plot information contained in weather warning messages
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Aerographer's Mate Third Class, NAVEDTRA 12850
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for plotting winds, seas, and tropical storms.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Plot ship's course using Mercator projection charts**
Knowledge you should have to perform this skill:	• Discuss the features of a mercator projection chart • Identify the equipment used to plot a ship's course • Identify the steps used to plot or determine course or direction
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the features of a mercator chart and the procedure for plotting and determining a ship's course using mercator projection charts.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Set up alidades, bearing circles, azimuth circles, and parallel motion protractors for gyrocompass navigation**
Knowledge you should have to perform this skill:	• Discuss the proper set up and use of alidades, bearing circles, azimuth circles, and parallel motion protractors • Identify the component parts of the equipment and their functions
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on setting up and using the alidade, bearing circle, azimuth circle, and parallel motion protractor and identify the component parts and function of each one.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Obtain and record compass book entries**
Knowledge you should have to perform this skill:	• State the purpose and requirements for compass check comparisons • Use compass error computations to determine deviation
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on obtaining and recording compass comparisons.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Measure distance on nautical charts**
Knowledge you should have to perform this skill:	• Identify the procedure used to measure distance on a nautical chart
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for measuring distance on nautical charts.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Identify gyrocompass failure alarms**
Knowledge you should have to perform this skill:	• Identify gyrocompass failure alarm procedures
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the procedures for a gyrocompass failure alarm.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Provide navigation input for Ship's Position Reports**
Knowledge you should have to perform this skill:	• Identify the requirements for the Ship's Position Report • Identify the information provided by the Ship's Position Report
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • COMNAVSURFLANT/COMNAVSURFPAC INST 3530.4
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the requirements for and the information provided by the Ship's Position Report.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Derive true direction from charted positions with parallel motion protractor (PMP) and compass rose**
Knowledge you should have to perform this skill:	• Identify the procedure for obtaining true direction with PMP and parallel rulers
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on obtaining true direction from charted positions using PMP and parallel rulers.

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General Skill Area	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Extract latitude and longitude from plotted positions**
Knowledge you should have to perform this skill:	• Identify the recommended procedure to obtain latitude and longitude of a charted position
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on obtaining the latitude and longitude of a charted position.

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General QM *Skill Area*	**Electronic Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Interpret fathometer displays, and annotate fathometer echograms**
Knowledge you should have to perform this skill:	• List the components of the fathometer • Identify the required information and the procedures used to annotate fathometer echograms
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the different components of the fathometer; operating a fathometer; and annotating fathometer echograms.

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General QM *Skill Area*	**Electronic Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Record fathometer soundings. Compare fathometer readings to charted depth. Determine ship's position by use of soundings**
Knowledge you should have to perform this skill:	• State the requirement for obtaining and recording fathometer soundings • Identify the procedures used to determine ship's position by the use of soundings
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • COMNAVSURFLANT/COMNAVSURFPAC INST 3530.4
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on taking and recording fathometer soundings; comparing fathometer soundings to charted depths; and determining a ship's position by use of soundings.

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General QM *Skill Area*	**Electronic Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Verify charted depths with fathometer/leadline**
Knowledge you should have to perform this skill:	• Identify the procedure used to compare charted depths with fathometer and leadline readings to verify chart accuracy
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Boatswain's Mate, NAVEDTRA 12100
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on verifying charted depths using fathometer and leadline readings.

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General QM *Skill Area*	**Electronic Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Plot ship's position by using the global positioning system (GPS)**
Knowledge you should have to perform this skill:	• Discuss the composition of the GPS satellite constellation • State the accuracy of the AN/WRN-6 • Identify the types of data information received by the AN/WRN-6 satellite navigation set • Identify the operating procedures for the AN/WRN-6
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Operator/Navigation Guide, AN/WRN-6
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for operating the AN/WRN-6 and identifying the types of data information and their accuracy.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Record times of celestial observations**
Knowledge you should have to perform this skill:	• Identify the preferred method of timing celestial observations • State the data to be recorded for celestial observations
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on marking and recording the times of celestial observations in the sight log.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Observe and record Sun's bearing using an azimuth circle**
Knowledge you should have to perform this skill:	• Explain the procedure used to observe and record the sun's bearing with an azimuth circle
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for observing the Sun's bearing; using an azimuth circle; and recording the Sun's bearing.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine gyrocompass error by amplitude of the Sun and by azimuth of Polaris**
Knowledge you should have to perform this skill:	• Identify the procedures, obtain data, and perform the calculations required to determine gyrocompass error by amplitude of the Sun • Identify the procedures, obtain data, and perform the calculations required to determine gyrocompass error by azimuth of Polaris
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the procedures, data, and calculations required for determining gyrocompass error by amplitude of the sun and by azimuth of Polaris.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Take bearings of celestial body at rising or setting point**
Knowledge you should have to perform this skill:	• Explain the procedure for taking bearings to a celestial body when rising or setting on the visible and celestial horizon
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for taking the bearing of a celestial body on the visible horizon and taking the bearing of a celestial body on the celestial horizon.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Compute time of local apparent noon (LAN)**
Knowledge you should have to perform this skill:	• Obtain the data and perform the calculations to compute LAN
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Nautical Almanac • Navigator's Workbook
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the information and publications used for computing the time of LAN and performing the required calculations.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Compute and record time of sunrise and sunset, moonrise and moonset, morning and evening twilight, and morning and evening star time**
Knowledge you should have to perform this skill:	• Identify the publications and data needed to compute the times of sunrise and sunset, moonrise and moonset, morning and evening twilight, and morning and evening star time • Perform the calculations required to compute the times of sunrise, sunset, moonrise, moonset, morning and evening twilight and star time
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9 • Nautical Almanac
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the necessary publications and forms; and performing the calculations to determine sunrise rise and moonset, morning and evening twilight, and morning and evening star time.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Compute zone time (ZT)**
Knowledge you should have to perform this skill:	• Define the term *zone time* • Identify the procedures used to compute zone time
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on defining the term *zone time* and the procedures for computing zone time.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Convert Zone Time (ZT) to Universal Coordinated Time (UCT) and Local Mean Time (LMT)**
Knowledge you should have to perform this skill:	• Define the terms *Universal Coordinated Time (UCT)* and *Local Mean Time (LMT)* • Identify the procedures and perform the calculations to convert ZT to UTC and LMT
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on defining the terms *UCT* and *LMT* and converting ZT to UCT and LMT.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Convert Universal Coordinated Time (UCT) to Zone Time (ZT) and Local Mean Time (LMT)**
Knowledge you should have to perform this skill:	• Identify the procedures and perform the calculations to convert Universal Coordinated Time (UCT) to Zone Time (ZT) and Local Mean Time (LMT)
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on converting UCT to ZT and LMT.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Convert Local Mean Time (LMT) to Zone Time (ZT) and Universal Coordinated Time (UCT)**
Knowledge you should have to perform this skill:	• Identify the procedures and perform the calculations to convert Local Mean Time (LMT) to Zone Time (ZT) and Universal Coordinated Time (UCT)
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on converting LMT to ZT and UCT.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine Universal Coordinated Time (UCT) of celestial observations**
Knowledge you should have to perform this skill:	• Identify the procedure and perform the calculations to convert the Zone Time (ZT) of a celestial observation to Universal Coordinated Time (UCT)
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on converting the ZT of a celestial observation to UCT.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Identify time zones (East or West) on Universal Coordinated Time (UCT) and standard meridians**
Knowledge you should have to perform this skill:	• Identify time zones, zone designations, and standard meridians • Determine time zone and zone designation for east and west longitudes
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying time zones, zone designation, and standard meridians.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Convert arc to time and time to arc**
Knowledge you should have to perform this skill:	• Explain the relationship between longitude and time • Identify the procedures and perform the calculations required to convert time to arc and arc to time
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on describing the relationship between longitude and time; and converting arc to time and time to arc.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Obtain Celestial data from Air Almanacs**
Knowledge you should have to perform this skill:	• Identify celestial data available from the Air Almanac • Obtain data from Air Almanac for celestial computations
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Air Almanac
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the types of celestial data available from the Air Almanac; and using the data for celestial computations.

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General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Compute entering arguments for Sight Reduction Tables for Marine Navigation**
Knowledge you should have to perform this skill:	• Identify entering arguments required for sight reduction using Pub. 229 • Compute Local Hour Angle (LHA) of Aries, the Sun, the stars, and the Planets
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Pub. 229 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying and computing the entering arguments required for Pub. 229.

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General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Obtain visual bearings using an alidade, bearing circle, and azimuth circle**
Knowledge you should have to perform this skill:	• Identify the components and functions of the telescopic alidade, bearing circle, and azimuth circle • Discuss the proper procedures for using the alidade, bearing circle, and azimuth circle to obtain visual bearings
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the component parts of the alidade, bearing circle, and azimuth circle; and the procedures for taking visual bearings.

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General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Obtain bearings using terrestrial ranges**
Knowledge you should have to perform this skill:	• Explain how terrestrial ranges are used by the mariner • Identify designated range markers to obtain visual bearings
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the uses of a terrestrial range; identifying designated range markers; and using recommended procedures to obtain visual bearings from terrestrial ranges.

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General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine ship's position by visual bearings to three or more objects**
Knowledge you should have to perform this skill:	• Discuss the factors to be considered when selecting landmarks for visual fixes • Explain the beam, bow, stern rule • Identify the process of determining the ship's position by true bearings
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for selecting landmarks and obtaining visual bearings; using the PMP; and correctly plotting and labeling fixes.

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General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine ship's position by bearing and range to a single point**
Knowledge you should have to perform this skill:	• Identify the procedures used to obtain, record, and plot a bearing and range taken from a single point • Discuss the cautions and limitations associated with the single object method and the use of radar bearings
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying and selecting navigation points; obtaining, recording, plotting, and labeling bearings and ranges; and identifying cautions and limitations of the single object method and the use of radar bearings.

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General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine gyrocompass error by gyro bearing trial and error (Franklin technique)**
Knowledge you should have to perform this skill:	• Identify the procedure used to determine gyro error by the Franklin technique
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on determining gyro error using the trial and error method (Franklin technique).

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General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Compute time and water level of high and low tides and at a specific time. Graph the tidal data**
Knowledge you should have to perform this skill:	• Define the terms associated with tides • Obtain data and perform calculations to compute time of high and low tides and water level at high tide, low tide, and at a specific time • Graph tidal data using the one-quarter, one-tenth rule
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on defining terms associated with tides; obtaining data and calculating the time of high and low tides; computing water level at high tide, low tide, and at a specific time; and graphing tidal data using the one-quarter, one-tenth rule.

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General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Compute tidal current direction and velocity. Graph tidal current data and compare with Table 3 of Tidal Current Tables book**
Knowledge you should have to perform this skill:	• Define the terms associated with tidal currents • Obtain data and perform calculations to compute current direction and velocity • Prepare graph of tidal current data and compare with Table 3 of Tidal Current Tables book
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on defining the terms associated with tidal currents; obtaining data and performing calculations to compute tidal current direction and velocity; and graphing tidal current data.

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General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine wind, tide, and current effects on ship's movements**
Knowledge you should have to perform this skill:	• Discuss how wind, tide, and current can affect a ship's movements
References you should study to gain the knowledge you need to perform this skill:	• Dutton's Navigation and Piloting • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on comparing the ship's course and speed made good to the intended track and determining the affects of wind, tide, and currents on ship's movements.

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General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Maintain Deck Logs**
Knowledge you should have to perform this skill:	• Identify the procedures for the preparation and maintenance of the Ship's Deck Log • Identify required Deck Log entries and standard abbreviations
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Preparing, Maintaining and Submitting the Ship's Deck Log, OPNAVINST 3100.7
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on preparing and maintaining the Ship's Deck Log and identifying the standard deck log entries and abbreviations.

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General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare oceanographic reports for shipment**
Knowledge you should have to perform this skill:	• Identify the procedures used to prepare, review, and submit surface weather observation forms • Prepare Meteorological Records Transmittal Form • Identify, prepare, and submit oceanographic reports identified in Pub. 606
References you should study to gain the knowledge you need to perform this skill:	• NAVOCEANCOMINST 3140.1K • Guide to Marine Observing and Reporting, Pub. 606
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the requirements and procedures for preparing, reviewing, and submitting weather observation forms; preparing meteorological transmittals; and preparing and submitting oceanographic reports.

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General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Inventory and order charts**
Knowledge you should have to perform this skill:	• Discuss chart inventory requirements • Identify chart ordering procedures
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Nautical Chart and Publication Allowance, CINCPACFLT/CINCLANTFLTINST 3140 • Catalog of Maps, Charts, and Related Products, CATP2V01U
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying chart inventory requirements and chart ordering procedures.

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General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare and maintain chart correction cards and make changes to charts**
Knowledge you should have to perform this skill:	• Recognize chart symbols, abbreviations, and terms • Identify the required data on a chart correction card • Transfer required data from old correction card to new correction card for a new edition chart • Maintain chart correction card files • Make chart corrections and annotate corrections on charts and chart correction cards from Weekly and Local Notice to Mariners and Broadcast Warnings
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Catalog of Maps, Charts, and Related Products, CATP2V01U • Chart No. 1
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the required procedures for preparing and maintaining chart correction cards; correcting charts using the cards; annotating corrections on charts; and obtaining information from notice to Mariners and Broadcast warnings.

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General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Stow charts and maintain chart files**
Knowledge you should have to perform this skill:	• Identify the procedures used to fold and properly label charts • Identify the procedures for the stowage and maintainance of charts
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for labeling, stowing, and maintaining nautical charts.

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General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Inventory, order, and maintain nautical publications**
Knowledge you should have to perform this skill:	• Identify the procedures used to conduct an annual publication inventory as required and verify publication allowance • Prepare an order for required publications • Maintain correction card system for nautical publications • Make corrections to nautical publications and annotate corrections on record of corrections page and publication correction card
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for inventorying, ordering, maintaining, and correcting nautical publications.

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General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare ship's position reports**
Knowledge you should have to perform this skill:	• Identify, compute, and record required data for the ship's position reports
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • COMNAVSURFLANT/COMNAVSURFPAC INST 3530.3A
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying and computing data and preparing and submitting the ship's position reports.

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General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare synoptic observation messages**
Knowledge you should have to perform this skill:	• Identify the requirements and references for synoptic weather messages • Encode and record observed weather data on the surface observation form and the synoptic message blank
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • NAVMETOCCOMINST 3140 • NAVMETOCCOMINST 3144
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the requirements and references for synoptic weather messages and encoding and recording observed weather data on the appropriate forms.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Interpret foreign chart information using sailing directions and local port directives**
Knowledge you should have to perform this skill:	• Identifying the procedures for using sailing directions, port directories, local port directives, and port information reports to interpret chart information
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on interpreting foreign chart information.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Review the Commanding Officer's (CO's) night orders and prepare inputs to the night orders**
Knowledge you should have to perform this skill:	• Identify the required navigational data contained in the CO's night orders
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the requirements of the CO's night orders.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Obtain radio time ticks, compare chronometers, compute successive daily rate (SDR) and average daily rate (ADR), compute predicted chronometer errors, maintain timepiece rate book, and make chronometer report**
Knowledge you should have to perform this skill:	• Identify the procedure used to obtain a radio time tick • Compare ship's chronometers with time tick and determine chronometer error • Identify the procedures used to compute and record chronometer errors, successive daily rates (SDR), average daily rate (ADR), and predicted chronometer
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on obtaining time tick information; comparing the ship's chronometers; calculating the SDR and ADR; and completing and submitting the Daily Chronometer Report.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Wind and set ship's clocks**
Knowledge you should have to perform this skill:	• Identify the procedures used to set comparing watch or start stopwatch on correct time • Locate, wind, and set ship's clocks as directed
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on setting or starting the stopwatch on the correct time; following the procedures for winding and setting ship's clocks; and maintaining the clock log.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Compute and apply variation on navigational charts**
Knowledge you should have to perform this skill:	- Locate the compass rose on the chart nearest to the area in which the ship is operating - Determine variation, annual increase/decrease, and year from the center of the compass rose - Determine variation, annual increase/decrease, and year from a bottom contour chart - Compute and apply actual magnetic variation
References you should study to gain the knowledge you need to perform this skill:	- Quartermaster, NAVEDTRA 12120 - Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on locating magnetic variation on navigational charts; determining variation, annual increase/decrease, and year from the center of the compass rose or the bottom contour chart; and computing actual magnetic variation.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Compare gyrocompass and magnetic compass and record errors and headings in magnetic compass logs**
Knowledge you should have to perform this skill:	• Identify the procedures used to obtain and compare gyrocompass heading and magnetic compass heading • Record gyro reading, gyro error, variation, magnetic compass reading in magnetic compass record book • Compute and record true heading, magnetic heading, and deviation in magnetic compass record book
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for obtaining and recording gyro reading, gyro error, variation, and magnetic compass reading and computing and recording true heading, magnetic heading, and deviation.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Correct magnetic compass headings using deviation tables**
Knowledge you should have to perform this skill:	• Apply deviation from compass deviation table to magnetic heading to determine compass course
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on determining the compass course by applying deviation from the compass deviation table to the magnetic heading.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Convert relative/magnetic bearings to true bearings**
Knowledge you should have to perform this skill:	• Identify the procedures used to apply ship's heading to relative bearings and determine true bearings • Apply variation and deviation to magnetic bearings and determine true bearings
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on converting relative and magnetic bearings to true bearings.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Record data in standard bearing book and maintain bearing log during magnetic piloting**
Knowledge you should have to perform this skill:	• Identify standard bear book requirements for gyro piloting • Identify standard bearing book requirements for magnetic piloting
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • COMNAVSURFLANT/COMNAVSURFPAC INST 3530.3A
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying required data and procedures for recording data in the standard bearing book and maintaining the bearing log during magnetic piloting.

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A *skill* you are expected to perform from the General Skill Area above:	**Sight and report visual contacts to Officer of the Deck (OOD)**
Knowledge you should have to perform this skill:	• Discuss proper visual search techniques • Identify the correct procedures to report a surface contact • Identify the correct procedures to report an air contact
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Lookout Training Handbook, NAVEDTRA 12968
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for searching and reporting visual surface or air contacts.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Dress and full dress ship**
Knowledge you should have to perform this skill:	• Explain the requirements and procedures for dressing and full-dressing ship
References you should study to gain the knowledge you need to perform this skill:	• Signalman, NAVEDTRA 12104-A • Flags, Pennants and Customs, NTP 13
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the requirements and procedures for dressing and full-dressing ship.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Render honors and ceremonies**
Knowledge you should have to perform this skill:	• Describe the requirements and procedures for rendering passing honors onboard a U.S. Navy ship or small boat • Identify the whistle signals used in rendering passing honors • Describe the honors required for officers, official visits, and changes of command • State the occasions for and the proper use of passing the word, boat gongs, boat hails, and side honors.
References you should study to gain the knowledge you need to perform this skill:	• Signalman, NAVEDTRA 12104-A • Flags, Pennants and Customs, NTP 13 • U. S. Navy Regulations, Chapter 12
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the requirements and procedures for rendering honors and ceremonies aboard U. S. Navy ships and small boats.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Observe sunrise and sunset and conduct morning and evening colors**
Knowledge you should have to perform this skill:	• Explain the procedures for observing sunrise and sunset in port and underway • Discuss the proper use of the ship's announcing system (1MC) and whistles to conduct morning and evening colors • Identify the signal flag associated with colors • Identify navigation lights required in port and underway
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Signalman, NAVEDTRA 12104-A • NTP 13
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on observing sunrise and sunset in port or underway; using the ship's announcing system to conduct colors; identifying the flag hoist to signal colors; and identifying required navigation lights.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Identify signal flags and pennant displays**
Knowledge you should have to perform this skill:	• Recognize and identify signal flags and pennant displays
References you should study to gain the knowledge you need to perform this skill:	• Signalman, NAVEDTRA, 12104-A • Allied Maritime Tactical Signal and Maneuvering Book, ATP 1, Volume II
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on recognizing and identifying the various signal flags and pennant displays.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Identify national ensign and union jack displays**
Knowledge you should have to perform this skill:	• Recognize and identify national ensign and union jack displays
References you should study to gain the knowledge you need to perform this skill:	• Signalman, NAVEDTRA 12104-A • NTP 13
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on recognizing and identifying national ensign and union jack displays.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Identify merchant flags of principal maritime and major naval powers**
Knowledge you should have to perform this skill:	• Recognize and identify merchant flags of principal maritime and major naval powers
References you should study to gain the knowledge you need to perform this skill:	• Signalman, NAVEDTRA 12104-A • Jane's Fighting Ships
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on recognizing and identifying merchant flags of principal maritime and major naval powers.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Identify visual storm warning signals**
Knowledge you should have to perform this skill:	• Recognize and identify the combinations of flags, pennants, and light signals used to indicate various storms and associated winds
References you should study to gain the knowledge you need to perform this skill:	• Signalman, NAVEDTRA • NTP 13
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on recognizing and identifying day and night storm warning signals and the different types of storms and associated winds.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Identify reduced visibility signals and interpret bell and gong signals**
Knowledge you should have to perform this skill:	• Identify signals sounded by vessels in various conditions during reduced visibility • Interpret the meaning of various bell and gong signals
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Navigation Rules International-Inland, COMDTINST M16672.2D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on recognizing and identifying signals required to be sounded by vessels in various conditions during reduced visibility and interpreting the meaning of bell and gong signals.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Identify international distress signals**
Knowledge you should have to perform this skill:	• Identify international distress signals and signals used to attract the attention of other vessels
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Navigation Rules, International-Inland, COMDTINST M16672.2D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying international distress signals and signals used to attract the attention of other vessels.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Identify navigational day shape and light displays**
Knowledge you should have to perform this skill:	• Identify navigational day shapes and light displays and their meanings
References you should study to gain the knowledge you need to perform this skill:	• Signalman, NAVEDTRA 12104-A • Navigation Rules, International-Inland, COMDTINST M16672.2D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying navigational day shapes and light displays and describing their meanings.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Identify navigational warnings contained in NAVAREAS, HYDROLANTS, and HYDROPACS**
Knowledge you should have to perform this skill:	• Identify the information contained in NAVAREA, HYDROLANT, and HYDROPAC messages • Determine and brief the possible effect of navigational warnings on current operations
References you should study to gain the knowledge you need to perform this skill:	• Notice to Mariners • COMNAVSURFLANT/COMNAVSURFPAC INST 3530.4
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying broadcast warning messages; and plotting the warnings and briefing the possible effects on current operations.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Identify day markers and range markers**
Knowledge you should have to perform this skill:	• Recognize day markers and range markers and identify their use
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on recognizing day markers and range markers and identifying their use.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Interpret and sound ship's bell, gong, and whistle signals**
Knowledge you should have to perform this skill:	• Identify and interpret the meaning of bell, gong, and whistle signals • Identify the requirements for ship's bell, gong, and whistle
References you should study to gain the knowledge you need to perform this skill:	• Navigation Rules, International-Inland, COMDTINST M16672.2D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on interpreting and sounding bell, gong, and whistle signals; and identifying the requirements for use of a ship's bell, gong, and whistle.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Sound danger signals**
Knowledge you should have to perform this skill:	• Identify the danger signal • Discuss the requirements for sounding the danger signal
References you should study to gain the knowledge you need to perform this skill:	• Navigation Rules, International-Inland, COMDTINST M16672.2D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying and sounding danger signals.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Energize ship's navigation lights for in port, under way, at anchor, special operations, and emergency situations**
Knowledge you should have to perform this skill:	• Identify the lighting requirements for vessels while in port, at anchor, or during underway, special operations, or emergency conditions • Locate, energize, and secure ship's navigation lights during in port, underway, at anchor, special operations, and emergency situations
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Navigation Rules, International-Inland, COMDTINST M16672.2D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the navigation lighting requirements for U.S. Navy ships while in port, underway, at anchor, or during special operations, and emergency operations.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Verify navigational light phase distinctions**
Knowledge you should have to perform this skill:	• Identify the characteristics of navigational light phases • Time and verify navigational light phases
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the publications used and performing the recommended procedures to verify navigational light phase distinctions.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Compute visibility of lights**
Knowledge you should have to perform this skill:	• Define the terms associated with the visibility of lights • Obtain data and perform calculations to compute the visibility of a navigational light
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on defining the terms associated with the visibility of navigational lights; identifying publications and information; and computing the visibility of lights.

Advancement Handbook for QM3

General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare bridge for getting underway and entering port**
Knowledge you should have to perform this skill:	• Identify required charts, publications, instruments, and equipment for getting underway and entering port • Complete navigation check-off list for getting underway and entering port
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the various charts, instruments, and publications required for getting underway or entering port; preparing the bridge for getting underway and entering port; and completing the navigation check-off list.

Advancement Handbook for QM3

General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare bridge for special evolutions (underway replenishment (UNREP), general quarters (GQ), anchorage, etc.)**
Knowledge you should have to perform this skill:	• Identify, provide, and set up additional requirements for special evolutions
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the requirements for special evolutions and following the procedures to prepare the bridge for special evolutions.

Advancement Handbook for QM3

General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Steer ship from after steering, steer by rudder order angle (ROA) indicator and shift steering control to the bridge**
Knowledge you should have to perform this skill:	• Identify the equipment used and orders exchanged to steer the ship from after steering, by rudder order angle indicator, and shifting steering control to the bridge from after steering
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions identifying the equipment used and orders exchanged for steering the ship from after steering; using rudder order angle indicator; and shifting control from after steering to the bridge.

Advancement Handbook for QM3

General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Steer ship by gyrocompass, magnetic compass, and shift steering control to emergency steering and control**
Knowledge you should have to perform this skill:	• Identify the equipment used and orders exchanged to steer the ship by gyrocompass, magnetic compass, or to shift steering to emergency steering and control
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the equipment and orders for steering the ship by gyrocompass; steering by magnetic compass; and shifting steering control to emergency steering and autopilot.

Advancement Handbook for QM3

General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Steer ship in restricted waters, during general quarters (GQ), underway replenishment (UNREP), man overboard recoveries, special sea and anchor details, and in accordance with the evasive steering plan**
Knowledge you should have to perform this skill:	• Identify the equipment used and orders exchanged to steer the ship in restricted waters, during GQ, UNREP, man overboard recoveries, or special sea and anchor details • Identify steering requirements in accordance with the evasive steering plan
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the equipment used and orders exchanged in steering the ship in restricted waters, during GQ, UNREP, man overboard recoveries, special sea and anchor detail, and in accordance with evasive steering plan.

Advancement Handbook for QM3

General QM *Skill Area*	**Communications**
A *skill* you are expected to perform from the General Skill Area above:	**Maintain radio navigational warning messages**
Knowledge you should have to perform this skill:	• Identify the proper procedures used to file and review radio navigational warning messages
References you should study to gain the knowledge you need to perform this skill:	• COMNAVSURFLANT/COMNAVSURFPAC INST 3530.4
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the procedures for filing, reviewing, and maintaining radio navigational warning messages.

Advancement Handbook for QM3

General QM *Skill Area*	**Weather**
A *skill* you are expected to perform from the General Skill Area above:	**Take barometric pressure readings and convert barometric station pressure to sea level pressure and altimeter setting**
Knowledge you should have to perform this skill:	• Identify barometer calibration requirements • Read and record barometric pressure in millibars and inches • Determine and apply height corrections for sea level and altimeter setting
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • NAVMETOCCOMINST 3144.1
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on taking barometric pressure readings; determining and applying barometer corrections; and reading and recording barometric pressure.

Advancement Handbook for QM3

General QM *Skill Area*	**Weather**
A *skill* you are expected to perform from the General Skill Area above:	**Take wet and dry bulb temperatures and determine relative humidity and dew point**
Knowledge you should have to perform this skill:	• Identify the equipment and procedures used to take temperature readings • Obtain temperature data and determine relative humidity and dew point
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • NAVMETOCCOMINST 3144.1 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the equipment used for temperature measurements and determining relative humidity and dew point.

Advancement Handbook for QM3

General QM *Skill Area*	**Weather**
A *skill* you are expected to perform from the General Skill Area above:	**Determine true wind, relative wind, apparent wind, and desired wind**
Knowledge you should have to perform this skill:	• Identify the equipment and procedures used to measure and compute wind speed and direction • Define the terms *true wind*, *relative wind*, *apparent wind*, and *desired wind* • Obtain data and perform maneuvering board solutions to compute true wind and desired wind
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • NAVMETOCCOMINST 3144.1 • Maneuvering Board Manual, Pub. 217
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on defining the terms *true wind*, *relative wind*, *apparent wind*, and *desired wind* and performing maneuvering board solutions.

Advancement Handbook for QM3

General QM *Skill Area*	**Weather**
A *skill* you are expected to perform from the General Skill Area above:	**Interpret hydrographic charts**
Knowledge you should have to perform this skill:	• Identify and interpret standard chart symbology • Locate and interpret oceanographic data
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting • Chart No. 1
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying and interpreting standard chart symbology and oceanographic data.

Advancement Handbook for QM3

General QM *Skill Area*	**Weather**
A *skill* you are expected to perform from the General Skill Area above:	**Interpret synoptic weather messages**
Knowledge you should have to perform this skill:	• Identify instructions and requirements for synoptic weather reporting • Interpret and explain encoded synoptic weather data
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • NAVMETOCCOMINST 3144.1D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying instructions and requirements for synoptic weather reporting and interpreting encoded synoptic weather data.

Advancement Handbook for QM3

General QM *Skill Area*	**Weather**
A *skill* you are expected to perform from the General Skill Area above:	**Observe, record, and report sea wave height and sea swell height and direction**
Knowledge you should have to perform this skill:	• Identify the instructions, forms, and procedures used to observe, record, and encode wave height and direction
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • NAVMETOCCOMINST 3144.1D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for observing, recording, and reporting wave height and direction.

Advancement Handbook for QM3

General QM *Skill Area*	**Weather**
A *skill* you are expected to perform from the General Skill Area above:	**Observe and record various weather conditions**
Knowledge you should have to perform this skill:	• Identify the symbols, order of entry, and intensity signs used to record present weather data • Encode present and past weather data for synoptic weather messages
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • NAVMETOCOMCINST 3144.1D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on observing weather conditions; identifying the symbols, order of entry, and intensity signs used to record present and past weather conditions; and encoding the weather data for synoptic weather messages.

Advancement Handbook for QM3

General QM *Skill Area*	**Weather**
A *skill* you are expected to perform from the General Skill Area above:	**Observe and record Celsius and Fahrenheit temperatures and convert Fahrenheit to Celsius and Celsius to Fahrenheit**
Knowledge you should have to perform this skill:	- Identify the equipment and procedures used to observe temperatures - Recall the formula used to convert temperatures from/to Fahrenheit and Celsius
References you should study to gain the knowledge you need to perform this skill:	- Quartermaster, NAVEDTRA 12120 - NAVMETOCCOMINST 3144.1D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the equipment and the procedures for obtaining temperatures; converting temperatures from Fahrenheit to Celsius; and converting temperatures from Celsius to Fahrenheit.

Part 2

Advancement Handbook for QM2

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine magnetic compass errors using visual bearings and ranges**
Knowledge you should have to perform this skill:	• Identify the procedures and perform calculations required to determine compass deviation by bearings on a distant object • Identify the procedures and perform calculations required to determine compass deviation by visual range
References you should study to gain the knowledge you need to perform this skill:	• Dutton's Navigation and Piloting • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the procedures and calculations used for determining magnetic deviations by visual bearings and ranges.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine and plot danger ranges and bearings**
Knowledge you should have to perform this skill:	• Identify the requirements for the use of danger ranges and bearings • Identify the procedures used to plot and label danger ranges and bearings
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's • COMNAVSURFLANT/COMNAVSURFPAC INST 3530.4
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the requirements for danger ranges and bearings and the procedures for plotting and labeling danger ranges and bearings.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine and plot slide bars**
Knowledge you should have to perform this skill:	• Explain the purpose and use of the slide bar technique in piloting • Discuss the procedures used to determine and plot slide bars
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9 • COMNAVSURFLANT/COMNAVSURFPAC INST 3530.4
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the purpose and requirements for the slide bar and identifying the procedures for determining and plotting slide bars.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine worst case circle using fix expansion method**
Knowledge you should have to perform this skill:	• Explain the fix expansion method and its purpose • Identify the factors used to calculate the error circle used in fix expansion • Explain the procedure for plotting fix expansion error circles
References you should study to gain the knowledge you need to perform this skill:	• Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the purpose and factors to be considered for fix expansion and plotting fix expansion error circles.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine magnetic compass errors using reciprocal bearings**
Knowledge you should have to perform this skill:	• Identify the procedure used to determine compass deviation by reciprocal bearings
References you should study to gain the knowledge you need to perform this skill:	• Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on determining compass deviation by the reciprocal bearing method.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine angle of turn, compute and plot ship's advance and transfer, establish turn points, and compute and plot turn bearings**
Knowledge you should have to perform this skill:	• Compute the angle of turn for a course change • Identify the reference data and calculations used to compute ship's advance and transfer • Discuss the purpose of turn bearings and the selection of a landmark used for a turn bearing • Obtain data and perform calculations to compute and plot turn bearings
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the data and calculations required to compute angle of turn, advance and transfer, and turn bearings.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Compute predicted radar landfalls**
Knowledge you should have to perform this skill:	• Determine predicted time of radar landfall based on ship's course, speed, and the maximum range of navigational radar
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on following the recommended procedures for computing the predicted time of radar landfall.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Plan and prepare restricted waters tracks**
Knowledge you should have to perform this skill:	• Discuss the factors to be considered when planning a restricted water track • Identify the requirements for chart and track preparation for a restricted water transit
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting • COMNAVSURFLANT/COMNAVSURFPAC INST 3530.4
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on following the procedures for planning and constructing restricted waters tracks and preparing charts for restricted waters transits.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare and execute precision anchoring plans**
Knowledge you should have to perform this skill:	• Discuss the factors to be considered when selecting an anchorage • Define the terms associated with precision anchoring • Identify the requirements for chart preparation and procedures used to plan and construct a precision anchorage • Discuss the steps of executing the anchorage and post-anchoring procedures
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for selecting, preparing, and executing a precision anchorage and identifying the terms associated with precision anchoring.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Plot ship's course using gnomonic projection charts**
Knowledge you should have to perform this skill:	• Identify the procedures for planning and constructing a great circle track using a gnomonic projection chart
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on planning and constructing a great circle track using a gnomonic projection chart.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Set up parallel motion protractor for relative bearing navigation and determine ship's position with relative bearings**
Knowledge you should have to perform this skill:	• Identify the procedures used to set up the parallel motion protractor for relative bearing navigation • Discuss the procedures used to plot relative bearings with the parallel motion protractor
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on following the procedures to set up the parallel motion protractor for relative bearing navigation; and plotting relative bearings.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Establish departure, landfall, and arrival points for great circle sailing**
Knowledge you should have to perform this skill:	• Consult charts, coast pilots, sailing directions, or fleet guides for pre-established harbor departure and arrival points • Determine and plot departure and arrival points for a great circle transit where pre-established points are not given
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on establishing departure and arrival points for great circle sailing.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Lay out navigational tracks for deployments**
Knowledge you should have to perform this skill:	• Identify the procedures used to plan and construct navigational tracks for deployments • Discuss and compare the use of great circle and rhumb line tracks
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on planning and constructing navigational tracks for deployments and using great circle and rhumb line tracks.

Advancement Handbook for QM2

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Perform plotting for man overboard**
Knowledge you should have to perform this skill:	• Identify the recommended bridge plotting procedure for man overboard • Explain the procedures for plotting a man overboard using the AN/WRN-6(V)
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Operator/Navigation Guide, Satellite Navigation Signals Set AN/WRN-6(V)
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the equipment and procedures used for plotting a man overboard using the AN/WRN-6(V).

Advancement Handbook for QM2

General QM *Skill Area*	**Celestial Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Obtain celestial data by marine sextant and plot ship's position by celestial navigation**
Knowledge you should have to perform this skill:	• Define the terms associated with celestial navigation • Identify the parts of the marine sextant and their function • Describe how the marine sextant works and the technique for using the sextant to obtain a celestial sight • Identify the publications, forms, data, and calculations used for sight reduction • Recall the procedures used to plot and advance a celestial line of position
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on defining the terms associated with celestial navigation; using the marine sextant, identifying its parts and technique for use; identifying the publications, forms, data, and calculations used for sight reduction; and plotting and advancing a celestial line of position.

Advancement Handbook for QM2

General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine ship's position by two or more bearings to a single point**
Knowledge you should have to perform this skill:	• Describe the procedures used to shoot, plot, and label a running fix • Explain the purpose of a running fix
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on shooting, plotting, and labeling a running fix and identifying the purpose of a running fix.

Advancement Handbook for QM2

General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine and plot two horizontal angles using a sextant and three-arm protractor**
Knowledge you should have to perform this skill:	• Identify the procedures used to set up and take horizontal sextant angles • Describe how sextant angles are plotted using the three-arm protractor to obtain ship's position
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for taking and plotting horizontal sextant angles and using the three-arm protractor.

Advancement Handbook for QM2

General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare charts for piloting**
Knowledge you should have to perform this skill:	• Identify and discuss all chart preparation requirements for piloting in restricted waters
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting • COMNAVSURFLANT/COMNAVSURFPAC INST 3530.4
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying chart preparation requirements for piloting in restricted waters.

Advancement Handbook for QM2

General QM *Skill Area*	**Coastal Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine gyrocompass errors by bearing to a distant object**
Knowledge you should have to perform this skill:	• Describe the procedure used to determine gyro error by bearings to a distant object
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on determining gyro error by bearings to a distant object.

Advancement Handbook for QM2

General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Determine chart accuracy**
Knowledge you should have to perform this skill:	• Identify the factors that help to determine a chart's accuracy
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting • Bowditch, Pub. 9
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the factors to consider when determining chart accuracy.

Advancement Handbook for QM2

General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare movement reports (MOVREPS)**
Knowledge you should have to perform this skill:	• Identify the requirements of the Movement Reporting System (MOVREPS) • Identify the required data and correct format of a MOVREP
References you should study to gain the knowledge you need to perform this skill:	• Operational Reports, NWP 10-1-10
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the requirements of the MOVREP system and identifying the data and format of a MOVREP.

Advancement Handbook for QM2

General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Make flag and pennant signals**
Knowledge you should have to perform this skill:	• Identify signal flags and pennants and their meanings
References you should study to gain the knowledge you need to perform this skill:	• Signalman, NAVEDTRA 12104-A • Allied Maritime Tactical Signal and Maneuvering Book, (ATP1) Vol. II • International Code of Signals, Pub. 102
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying signal flags and pennants and their meanings.

Advancement Handbook for QM2

General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Inform forecastle of the type bottom, depth of water at anchorage, and scope of chain to be used for precision anchorage**
Knowledge you should have to perform this skill:	• Identify and review charts and publications for indications of bottom composition and depth of water • State the rule for determining the recommended scope of anchor chain
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Chart No. 1
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on determining bottom composition and the scope of anchor chain to be used.

Advancement Handbook for QM2

General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Compute and plot swing and drag circles for precision anchorage**
Knowledge you should have to perform this skill:	• Define the terms *swing circle* and *drag circle* and explain their purposes • Identify the procedures used to compute and plot the swing circle and drag circle
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on computing and plotting the swing and drag circle and identifying the purpose of the swing and drag circle in a precision anchorage.

Part 3

Advancement Handbook for QM1

Advancement Handbook for QM1

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Determine initial course, distance, and final course for Great Circle sailing**
Knowledge you should have to perform this skill:	• Discuss the process of constructing a great circle track • Explain the procedures used to determine great circle initial course and distance with a Gnomonic chart and with a navigation software program • Discuss the technique used to transfer a great circle track from a Gnomonic to a Mercator chart
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on constructing a great circle track; the procedures for determining great circle initial course and distance; and transferring a great circle track from a Gnomonic to a Mercator chart.

Advancement Handbook for QM1

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Coordinate exchange of inter-ship navigation data**
Knowledge you should have to perform this skill:	• Identify the requirements to report and compare ship's position and navigational data
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • COMNAVSURFLANT/COMNAVSURFPA INST 3530.4
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the requirements for reporting and comparing ship's position and navigational data.

Advancement Handbook for QM1

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Recommend course of action based on International or Inland rules of the road**
Knowledge you should have to perform this skill:	• Interpret and explain International and Inland Steering and Sailing Rules • Identify the proper action of vessels in sight of one another
References you should study to gain the knowledge you need to perform this skill:	• Navigation Rules International-Inland, COMDTINST M16672.2D
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying International and Inland Steering and Sailing Rules and their meanings and identifying the proper action of vessels in sight of one another.

Advancement Handbook for QM1

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Conduct magnetic compass sensibility tests, swing ship, and prepare compass deviation tables**
Knowledge you should have to perform this skill:	• Identify the requirements and procedures for testing and adjusting a magnetic compass as covered by the Planned Maintenance System (PMS) • Explain the procedure for swinging ship
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9 • Handbook of Magnetic Compass Adjustment, Pub. 226
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the requirements and procedures for testing and adjusting a magnetic compass; and identifying the procedures for swinging ship.

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General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Review deck logs**
Knowledge you should have to perform this skill:	• Identify the proper procedures used to prepare, maintain, and submit the Ship's Deck Log
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Preparing, Maintaining and Submitting the Ship's Deck Log, OPNAVINST 3100.7B
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the procedures for preparing, maintaining, and submitting the Ship's Deck Log.

Advancement Handbook for QM1

General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Determine chart allowances and nautical publication allowances**
Knowledge you should have to perform this skill:	• Identify the instructions which specify nautical chart and publication allowances for Navy commands • Discuss nautical chart and publication allowance procedures • Define the terms associated with nautical chart and publication allowances
References you should study to gain the knowledge you need to perform this skill:	• CINCLANTFLTINST 3140.9A, Nautical Chart and Publication Allowance • CINCPACFLTINST 3140.3A
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on defining terms, recognizing the instructions and procedures associated with nautical chart and publication allowances.

Advancement Handbook for QM1

General QM *Skill Area*	**Technical Administration**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare optimum track ship routing (OTSR) requests**
Knowledge you should have to perform this skill:	• Identify the instructions and procedures used to prepare OTSR requests
References you should study to gain the knowledge you need to perform this skill:	• U. S. Navy Meteorological and Oceanographic Support System Manual, NAVMETOCCOMINST 3140.1K
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on preparing OTSR requests and reports.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Select essential charts for proposed transits**
Knowledge you should have to perform this skill:	• Identify the procedures and publications used to select charts for proposed transits
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Catalog of Maps, Charts, and Related Products, CATP2V01U
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the publications and procedures to select charts for proposed transits.

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General QM *Skill Area*	**General Watchstanding**
A *skill* you are expected to perform from the General Skill Area above:	**Compute times and distances to drop anchor**
Knowledge you should have to perform this skill:	• Explain the procedures used to execute a precision anchorage • Recall the information required from the navigator when approaching a precision anchorage
References you should study to gain the knowledge you need to perform this skill:	• Quartermaster, NAVEDTRA 12120 • Bowditch, Pub. 9 • Dutton's Navigation and Piloting
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the procedures for executing a precision anchorage and identifying required navigation reports used during a precision anchorage.

Advancement Handbook for QM1

General QM *Skill Area*	**Weather**
A *skill* you are expected to perform from the General Skill Area above:	**Plot locations and probable paths of storm centers (hurricanes, typhoons, etc.)**
Knowledge you should have to perform this skill:	• Identify the procedures used to plot tropical storms, forecast tracks, and destructive winds and seas
References you should study to gain the knowledge you need to perform this skill:	• Aerographer's Mate Third Class, NAVEDTRA 12850 • Bowditch, Pub. 9 • COMNAVSURFPAC/COMNAVSURFLANT INST 3140.2, Tropical Cyclone Evasion Handbook
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on plotting tropical storm locations, forecast tracks, and destructive winds and seas.

Part 4

Advancement Handbook for QMC

Advancement Handbook for QMC

General QM *Skill Area*	**Navigation**
A *skill* you are expected to perform from the General Skill Area above:	**Evaluate effectiveness of force navigation**
Knowledge you should have to perform this skill:	• Develop a working knowledge of the Surface Ship Navigation Department Organization and Regulations Manual • Review current force directives for effectiveness
References you should study to gain the knowledge you need to perform this skill:	• COMNAVSURFLANT/COMNAVSURFPAC INST 3530.4
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the content found in the joint navigation guidelines as promulgated by the Surface Ship Navigation Department Organization and Regulations Manual.

Advancement Handbook for QMC

General QM *Skill Area*	**Communications**
A *skill* you are expected to perform from the General Skill Area above:	**Encode and decode signals using Allied Tactical Publications (ATP)**
Knowledge you should have to perform this skill:	• Review and discuss the general instructions in ATP 1, Volume II
References you should study to gain the knowledge you need to perform this skill:	• ATP 1, Volume II, Allied Maritime Tactical Signal and Maneuvering Book
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on encoding and decoding tactical signals using ATP 1, Volume II.

Advancement Handbook for QMC

General QM *Skill Area*	**Weather**
A *skill* you are expected to perform from the General Skill Area above:	**Make recommendations for storm evasion**
Knowledge you should have to perform this skill:	• Identify and discuss the general rules for tropical cyclone evasion as they apply to ships at sea
References you should study to gain the knowledge you need to perform this skill:	• Bowditch, Pub. 9 • COMNAVSURFPAC/COMNAVSURFLANT INST 3140.2, Tropical Cyclone Evasion Handbook
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identifying the general rules for tropical cyclone evasion as they apply to ships at sea.

Appendix 1

References Used in This Advancement Handbook

Rating	Short Title	Long Title	Chapters/ Paragraphs	Stocking Point
QM3	0584-LP-180-8800	United States Navy Regulations - 1990	Chapter 12	Note 1
		Air Almanac		Note 10
	ATP1, Volume II	Allied Maritime Tactical Signal and Maneuvering Book		Notes 1 & 2
	Bowditch, Pub. 9	American Practical Navigator		Note 5
	CATP2V01U	Catalog of Maps, Charts, and Related Products		Note 3
	Chart No. 1	United States of America Nautical Chart Symbols and Abbreviations		Note 3
	CINCPACFLTINST 3140.3A/CINCLANTFL TINST 3140.9A	Nautical Chart and Publication Allowance		Note 3
	COMDTINST M16672.2D	Navigation Rules, International-Inland		Notes 3 & 4
	DUTTON'S	Dutton's Navigation and Piloting		Note 5
	EE170-AB-GYD-010/AN/WRN-6(V)	Technical Manual Operator/Navigation Guide Satellite Signals Navigation Set AN/WRN-6(V)		Note 11
	JANE'S	Jane's Fighting Ships		Note 5
	NAVMETOCCOMINST 3140.1K	U. S. Navy Meteorological and Oceanographic Support Systems Manual		Note 8
	NAVMETOCCOMINST 3144.1D	U. S. Navy Manual for Ship's Surface Weather Observations		Note 8

	NAVOCEANCOMINST 3140.1K	U. S. Navy Meteorological and Oceanographic Support Systems Manual		Note 8
	NAVEDTRA 12100	Boatswain's Mate Training Manual		Note 1
	NAVEDTRA 12120	Quartermaster Training Manual		Note 1
	NAVEDTRA 12104-A	Signalman Training Manual		Note 1
	NAVEDTRA 12850	Aerographer's Mate Third Class Training Manual		Note 1
	NAVEDTRA 12968	Lookout Training Handbook		Note 1
	NTP 13	Flags, Pennants and Customs		Note 7
	OPNAVINST 3100.7	Preparing, Maintaining and Submitting the Ship's Deck Log		Note 9
	Pub 217	Maneuvering Board Manual		Note 1 Note 3
	Pub 229	Sight Reduction Tables for Marine Navigation		Note 3 Note 12
	Pub 606	Guide to Marine Observing and Reporting		Note 3
QM1	COMNAVSURFLANT/ COMNAVSURFPAC INST 3530.4	Surface Ship Navigation Department Organization and Regulations Manual		Note 13
	Pub. 226	Handbook of Magnetic Compass Adjustment		Note 1 Note 3
QMC	COMNAVSURFPAC/C OMNAVSURFLANT INST 3140.2	Tropical Cyclone Evasion Handbook		Note 13

LEGEND:

Note 1 – To order, MILSTRIP to NAVICP PHILA (Stk No. from NAVSUP P2002) or via
INTERNET http://www.nll.navsup.navy.mil

Note 2 – National Imagery & Mapping Agency (NIMA), CATP1V01
Customer Help Desk: 1-800-455-0899
DSN: 490-1236
Com: (314) 260-1236

Note 3 – National Imagery & Mapping Agency (NIMA), CATP2V01U
Customer Help Desk: 1-800-455-0899
DSN: 490-1236
Com: (314) 260-1236

Note 4 – INTERNET http://www.uscg.mil.vtm/pages/rules.htm

Note 5 – Commercial Purchase

Note 6 – Defense Information Agency Register (DIAR) 59-1

Note 7 – Download or order as directed by ALCOM 062/98

Note 8 – Ltr request to: Commander
Attn: Naval Meteorology & Oceanography
1020 Balch Boulevard
Stennis Space Center MS 39529-5005

Note 9 – INTERNET http://www.neds.nebt.daps.mil/

Note 10 – Department of Navy, US Naval Observatory
3450 Massachusetts Avenue, NW
Washington, DC 20392-5420

Note 11 – Ltr request to: Commander
Space and Naval Warfare Systems Command
Washington, DC 20363-5100

Note 12 – Purchase from Government Printing Office (GPO)

Note 13 – Fleet Publications Library CD-ROM:
Ltr request to: Commanding Officer
Attn: CD-ROM Team Code N911
NCTAMS LANT
9625 Moffett Ave
Norfolk, VA 23511-2784